

REMARKS

Applicants appreciate the Examiner's allowance of Claims 1, 4, 7, 9, 10, 29, 31, 34, 36, 39, 41, 45, 47, 51, 53, 56, 58, 62, 64, 68 and 70.

Applicants will now address the Examiner's remaining rejection in the Office Action.

Claim Rejections - 35 USC §103

In the Office Action, the Examiner rejects Claims 11-12, 14-19 and 74-79 under 35 USC §103(a) as being unpatentable over Lee et al. (IEEE Trans Magn. Col. 31, no. 6, Nov. 1995, p. 2728-2730). This rejection is respectfully traversed.

While Applicants traverse this rejection, in order to advance the prosecution of this application, Applicants have amended independent Claim 11 to recite that the film thickness of said intermediate layer is in a range of 5 to 50 angstroms.

Applicants respectfully submit that Claim 11 as amended is patentable over Lee as Lee does not disclose or suggest such a film thickness of the intermediate layer. Further, this feature is not just a design matter. Rather, the inventors of the present application have discovered unexpected and advantageous results from such film thickness. Lee provides no suggestion of such results.

More specifically, independent Claim 11 is directed to a seed layer structure to improve magnetic property. In contrast, Lee focuses its attention between the seed layer and the magnetic layer. For example, Lee discloses that the Cr layer is inserted between the NiAl layer and Co based magnetic layer to improve magnetic property and discloses an example in which the Cr is inserted between the NiAl layers (NiAl(2.5nm)/Cr(2.5nm)/NiAl(2.5nm)/Cr(2.5nm)).

The inventors of the claimed invention, however, have focused on the problem that as the non-magnetic film becomes thicker, it increases the coercive force but also generates excessively fine

particles on the under layer (or magnetic layer) which is formed on the non-magnetic film, leading to generation of thermal fluctuation. The inventors have found that division of the non-magnetic film prevents generation of the excessively fine particles on the non-magnetic film keeping the coercive force high, and thus curbing the influence of the thermal fluctuation maintaining the coercive force high.

While Lee may disclose an under layer/non-magnetic film/intermediate layer/non-magnetic film, the claimed invention and Lee differ in function of the layer corresponding to the intermediate layer (and as a result, the thicknesses of the layers). For example, Lee does not have the technical idea, conception or appreciation of providing the intermediate layer with a view to dividing the non-magnetic film. Rather, Lee just laminates multiple combinations of the intermediate layer and non-magnetic film having a same film thickness. In contrast, the intermediate layer of the claimed invention is very thin compared to the non-magnetic film because it has only to divide the non-magnetic film (in Lee, the intermediate layer is disposed to increase the coercive force). In other words, in the claimed invention, the intermediate layer is intended to divide the non-magnetic film, and therefore, the inventors discovered, that the thinner it is, the better. Applicants have amended independent Claim 11 to reflect this feature, i.e. that the film thickness of the intermediate layer is in a range of 5 to 50 angstroms. As shown above, this feature is not disclosed or suggested by Lee, there is no appreciation in Lee for such a feature (or even suggestion or disclosure of a thinner intermediate layer than the non-magnetic film), and this feature is highly advantageous and not merely a matter of design choice.

Therefore, it is respectfully submitted that independent Claim 11 and those claims dependent thereon are not disclosed or suggested by Lee and are patentable thereover. Accordingly, it is requested that this rejection be withdrawn.

New Claims

Applicants are also adding new Claims 80-102 herewith. Please charge our deposit account 50/1039 for any fee due for these new claims. It is respectfully submitted that these claims are also allowable over the art.

For example, with regard to Claims 80-90, Lee does not disclose or suggest that the intermediate layer is thinner than the non-magnetic film or that $K_u \cdot v/kT$, which is one of indicators of thermal fluctuation resistance, is greater than or equal to 90, as in new Claims 80-90. With regard to Claims 91-102, Applicants submit that compared with Lee, which uses Cr alone as an intermediate layer, only the particle diameter growth and distribution can be controlled without deteriorating the matching with the upper and lower non-magnetic films, and thus dispersion of the magnetic properties can be reduced, and Lee does not disclose or suggest the intermediate layer comprising Cr and at least one element selected from a group consisting of Mo, V, W, and/or Ta, as in new Claims 91-102.

Accordingly, it is respectfully requested that these new claims be entered and allowed.

Conclusion

It is respectfully submitted that the present application is in a condition for allowance and should be allowed.

If any further fee should be due for this amendment, please charge our deposit account 50/1039.

Favorable reconsideration is earnestly solicited.

Respectfully submitted,

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